

# PATENT COOPERATION TREATY

09/297.703

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From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 71.1)

To:

Keith W Nash & Co.  
90-92 Regent Street  
Cambridge CB2 1DP  
GRANDE BRETAGNE

15 FEB 1999

Date of mailing  
(day/month/year)

11.02.99

Applicant's or agent's file reference  
MJL/C283.1/N

## IMPORTANT NOTIFICATION

International application No.  
PCT/GB97/03032

International filing date (day/month/year)  
04/11/1997

Priority date (day/month/year)  
05/11/1996

Applicant

NATIONAL STARCH AND CHEMICAL ... et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

European Patent Office  
D-80298 Munich  
Tel. (+49-89) 2399-0, Tx: 523656 epmu d  
Fax: (+49-89) 2399-4465

Authorized officer

Vullo, C

Tel. (+49-89) 2399-8061



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>MJL/C283.1/N</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (PCT/IPEA/416)	
International application No. <b>PCT/GB97/03032</b>	International filing date (day/month/year) <b>04/11/1997</b>	Priority date (day/month/year) <b>05/11/1996</b>
International Patent Classification (IPC) or national classification and IPC <b>C12N15/82</b>		
Applicant <b>NATIONAL STARCH AND CHEMICAL ... et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand <b>11/04/1998</b>	Date of completion of this report <b>11.02.99</b>
Name and mailing address of the IPEA/   <b>European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465</b>	Authorized officer  <b>Ury, A</b>  Telephone No. (+49-89) 2399-8411  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB97/03032

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-44 as originally filed

**Claims, No.:**

1-31 as originally filed

**Drawings, sheets:**

1/18-18/18 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB97/03032

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims 5-10, 14-27, 30-31
	No: Claims 1-4, 11-13
Inventive step (IS)	Yes: Claims 5-10, 14-27, 30-31
	No: Claims 1-4, 11-13
Industrial applicability (IA)	Yes: Claims 1-31
	No: Claims

**2. Citations and explanations**

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB97/03032

**Item V.**

Reference is made to the following documents:

- D1: Plant Molecular Biology, 20, 1992, pp.809-819
- D2: The Plant Journal, 7(1), 1995, pp.3-15
- D3: Plant Molecular Biology, 30, 1996, pp.97-108
- D4: EMBL Sequence data library, 1994, Acc. No. G10545.

- I) The sequences depicted in Figure 4 and Figure 13 relate to two newly identified SBE II from Cassava.
- However, due to the broad and quite unclear formulation used in claims 1-3 and 12 ("effective portion"; see also the non-limitative definition of this expression given in the description pages 3-4 and "functionally equivalent nucleotide sequence which hybridises under stringent hybridisation conditions") and in view of the prior art which discloses SBE having considerable homology to the claimed sequences, novelty of present claims 1-4 and 11-13 cannot be acknowledged. Indeed, documents D1-D4 disclose sequences and constructs which fall under the scope of said claims.
- For instance, the clone disclosed in D2, containing a 3,55 kb insert present in pJAM425 and obtained from a cDNA library in  $\lambda$ gt10 encodes a SBE II having 81,1% identity in 2138 bp overlap with the nucleic acid sequence of Fig.4.
  - The sequence of SBE2.2 disclosed in Fig.2 of D3 has 75,9% identity in 818 aa overlap with the amino acid sequence of Fig.4.
- The pea SBE I and SBE II mentioned pages 17 and 18 of the description are also relevant with respect to lack of novelty of the above cited claims.
- II) For the assessment of present claim 28 on the question of whether or not it fulfils the requirements of novelty, no unified criteria exist in the PCT. The patentability can also be dependent upon the formulation of the claim. The EPO, for example, does not recognize a product as novel merely by the fact that it is produced by means of a new process.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB97/03032

- III) The present invention is based on the identification, cloning and sequencing of two SBE II genes from Cassava. Although some of the genes involved in starch biosynthesis have been cloned from Cassava (see D1 and D2), including SBE I (see the description of the application page 2), none of the cited prior art documents discloses nor suggests the two newly identified SBE II according to the present application.

Thus, the subject-matter of the claims which have not objected to for lack of novelty seem to fulfil the requirements of Article 33.2 and 3 PCT.

**Item VIII.**

The term "corresponding region" used in claims 6 and 16 is vague and unclear and leave the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT).

From the INTERNATIONAL SEARCHING AUTHORITY

**PCT**

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT  
OR THE DECLARATION

(PCT Rule 44.1)

To:  
Keith W Nash & Co  
90-92 Regent Street  
Cambridge CB2 1DP  
UNITED KINGDOM

Date of mailing  
(day/month/year) 20/05/1998

Applicant's or agent's file reference MJL/C283.1/N	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/GB 97/03032	International filing date (day/month/year) 04/11/1997
Applicant NATIONAL STARCH AND CHEMICAL ... et al.	

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.  
Filing of amendments and statement under Article 19  
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicants's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Mireille Claudepierre
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## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

#### What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.



## NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

### "Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

### Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

### Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference MJL/C283.1/N	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 97/ 03032	International filing date (day/month/year) 04/11/1997	(Earliest) Priority Date (day/month/year) 05/11/1996
Applicant  NATIONAL STARCH AND CHEMICAL ... et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).

2. ☐ Unity of invention is lacking (see Box II).

3. ☒ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing

☒ filed with the international application.

☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ Transcribed by this Authority

4. With regard to the title, ☒ the text is approved as submitted by the applicant

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is:

Figure No. 1 ☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

# INTERNATIONAL SEARCH REPORT

National Application No

PCT/GB 97/03032

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 6 C12N15/82 C12N9/10 C12Q1/68 C12N1/21 C12N15/54  
A01H5/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C12Q A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>SALEHUZZAMAN, S.N.I.M., ET AL . : "CLONING, PARTIAL SEQUENCING AND EXPRESSION OF A cDNA CODING FOR BRANCHING ENZYME IN CASSAVA" PLANT MOLECULAR BIOLOGY, vol. 20, 1992, pages 809-819, XP002056647 PAGE 810, LEFT; PAGE 814, RIGHT COLUMN, LINE 11-20; PAGE 817, RIGHT COLUMN, PAGE 818, LAST PARAGRAPH</p> <p style="text-align: center;">--- -/--</p>	<p>1-3, 11-13</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

28 April 1998

Date of mailing of the international search report

20/05/1998

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Holtorf, S

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 97/03032

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BURTON R A ET AL: "STARCH BRANCHING ENZYMES BELONGING TO DISTINCT ENZYME FAMILIES ARE DIFFERENTIALLY EXPRESSED DURING PEA EMBRYO DEVELOPMENT" PLANT JOURNAL, vol. 7, no. 1, January 1995, pages 3-15, XP002014042 cited in the application see the whole document ---	1-3, 11-13
X	FISHER, D.K., ET AL.: "TWO CLOSELY RELATED cDNAs ENCODING STARCH BRANCHING ENZYME FROM ARABIDOPSIS THALIANA" PLANT MOLECULAR BIOLOGY, vol. 30, 1996, pages 97-108, XP002056648 see figure 3 ---	1-4, 11-13
X	BURTON, R.A., ET AL.: "STARCH BRANCHING ENZYMES BELONGING TO DISTINCT ENZYME FAMILIES ARE DIFFERENTIALLY EXPRESSED DURING PEA EMBRYO DEVELOPMENT" EMBL SEQUENCE DATA LIBRARY, 6 July 1994, HEIDELBERG, GERMANY, XP002056649 ACCESSION No. G10545 ---	1-3, 11-13
A	WO 92 11375 A (AMYLOGENE HB) 9 July 1992 PAGE 7,8,12; PAGE 24; PAGE 25, LINE 6-19 ---	1-31
A	WO 94 11520 A (ZENECA LTD ;KEELING PETER LEWIS (GB)) 26 May 1994 PAGE 2, LINE 31-36; PAGE 4, LINE 29-36; PAGE 5 ---	1-31
A	WO 95 26407 A (NAT STARCH CHEM INVEST ;COOKE DAVID (GB); GIDLEY MICHAEL JOHN (GB)) 5 October 1995 POTATO SBE GENE , USED IN ANTISENSE APPROACH see the whole document ---	1-31
P,X	WO 96 34968 A (NAT STARCH CHEM INVEST ;COOKE DAVID (GB); DEBET MARTINE (GB); GIDL) 7 November 1996 PAGE 4,5; PAGE 8,14,21; CLAIM 66 ---	1-3, 11-13,15
P,X	WO 97 22703 A (DU PONT ;HUBBARD NATALIE LOUISE (US); KLEIN THEODORE MITCHELL (US)) 26 June 1997 see the whole document ---	12,13

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 97/03032

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 97 20040 A (AMYLOGENE HB ;EK B0 (SE); KHOSNOODI JAMSHID (SE); LARSSON CLAS TOM) 5 June 1997 see the whole document -----	1-4, 11-13
P,X	GAO,M., ETAL. : "INDEPENDENT GENETIC CONTROL OF MAIZE STARCH-BRANCHING ENZYMES IIa AND IIb" PLANT PHYSIOLOGY, vol. 114, no. 1, 1997, pages 69-78, XP002056650 see the whole document -----	12,13

## INTERNATIONAL SEARCH REPORT

Information on patent family members

National Application No

PCT/GB 97/03032

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9211375 A	09-07-92	SE 467160 B AU 9109791 A EP 0563201 A PL 169859 B SE 9004095 A	01-06-92 22-07-92 06-10-93 30-09-96 01-06-92
WO 9411520 A	26-05-94	AU 5428594 A	08-06-94
WO 9526407 A	05-10-95	AU 688006 B AU 1902895 A CA 2186399 A EP 0754235 A	05-03-98 17-10-95 05-10-95 22-01-97
WO 9634968 A	07-11-96	AU 5509996 A EP 0826061 A	21-11-96 04-03-98
WO 9722703 A	26-06-97	AU 1684697 A	14-07-97
WO 9720040 A	05-06-97	AU 7716596 A SE 9504272 A SE 9601506 A	19-06-97 30-05-97 30-05-97

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

United States Patent and Trademark  
Office  
(Box PCT)  
Crystal Plaza 2  
Washington, DC 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing:

14 May 1998 (14.05.98)

International application No.:

PCT/GB97/03032

Applicant's or agent's file reference:

MJL/C283.1/N

International filing date:

04 November 1997 (04.11.97)

Priority date:

05 November 1996 (05.11.96)

Applicant:

JOBLING, Stephen, Alan et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International preliminary Examining Authority on:

11 April 1998 (11.04.98)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was



was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer:

J. Zahra

Telephone No.: (41-22) 338.83.38

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 97/03032

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 97 20040 A (AMYLOGENE HB ;EK BO (SE); KHOSNOODI JAMSHID (SE); LARSSON CLAS TOM) 5 June 1997 see the whole document ---	1-4, 11-13
P, X	GAO, M., ETAL. : "INDEPENDENT GENETIC CONTROL OF MAIZE STARCH-BRANCHING ENZYMES IIa AND IIb" PLANT PHYSIOLOGY, vol. 114, no. 1, 1997, pages 69-78, XP002056650 see the whole document -----	12, 13



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 97/03032

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9211375 A	09-07-92	SE 467160 B AU 9109791 A EP 0563201 A PL 169859 B SE 9004095 A	01-06-92 22-07-92 06-10-93 30-09-96 01-06-92
WO 9411520 A	26-05-94	AU 5428594 A	08-06-94
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WO 9722703 A	26-06-97	AU 1684697 A	14-07-97
WO 9720040 A	05-06-97	AU 7716596 A SE 9504272 A SE 9601506 A	19-06-97 30-05-97 30-05-97

# PATENT COOPERATION TREATY

# PCT

REC'D 15 FEB 1999

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference MJL/C283.1/N	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (PCT/IPEA/416)	
International application No. PCT/GB97/03032	International filing date (day/month/year) 04/11/1997	Priority date (day/month/year) 05/11/1996
International Patent Classification (IPC) or national classification and IPC C12N15/82		
Applicant NATIONAL STARCH AND CHEMICAL ... et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 11/04/1998	Date of completion of this report 11.02.99
Name and mailing address of the IPEA/   European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer  Ury, A  Telephone No. (+49-89) 2399-8411



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB97/03032

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-44 as originally filed

**Claims, No.:**

1-31 as originally filed

**Drawings, sheets:**

1/18-18/18 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB97/03032

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	5-10, 14-27, 30-31
	No:	Claims	1-4, 11-13
Inventive step (IS)	Yes:	Claims	5-10, 14-27, 30-31
	No:	Claims	1-4, 11-13
Industrial applicability (IA)	Yes:	Claims	1-31
	No:	Claims	

**2. Citations and explanations**

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB97/03032

**Item V.**

Reference is made to the following documents:

- D1: Plant Molecular Biology, 20, 1992, pp.809-819
- D2: The Plant Journal, 7(1), 1995, pp.3-15
- D3: Plant Molecular Biology, 30, 1996, pp.97-108
- D4: EMBL Sequence data library, 1994, Acc. No. G10545.

- I) The sequences depicted in Figure 4 and Figure 13 relate to two newly identified SBE II from Cassava.
- However, due to the broad and quite unclear formulation used in claims 1-3 and 12 ("effective portion"; see also the non-limitative definition of this expression given in the description pages 3-4 and "functionally equivalent nucleotide sequence which hybridises under stringent hybridisation conditions") and in view of the prior art which discloses SBE having considerable homology to the claimed sequences, novelty of present claims 1-4 and 11-13 cannot be acknowledged. Indeed, documents D1-D4 disclose sequences and constructs which fall under the scope of said claims.
- For instance, the clone disclosed in D2, containing a 3,55 kb insert present in pJAM425 and obtained from a cDNA library in  $\lambda$ gt10 encodes a SBE II having 81,1% identity in 2138 bp overlap with the nucleic acid sequence of Fig.4.
  - The sequence of SBE2.2 disclosed in Fig.2 of D3 has 75,9% identity in 818 aa overlap with the amino acid sequence of Fig.4.
- The pea SBE I and SBE II mentioned pages 17 and 18 of the description are also relevant with respect to lack of novelty of the above cited claims.
- II) For the assessment of present claim 28 on the question of whether or not it fulfils the requirements of novelty, no unified criteria exist in the PCT. The patentability can also be dependent upon the formulation of the claim. The EPO, for example, does not recognize a product as novel merely by the fact that it is produced by means of a new process.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB97/03032

III) The present invention is based on the identification, cloning and sequencing of two SBE II genes from Cassava. Although some of the genes involved in starch biosynthesis have been cloned from Cassava (see D1 and D2), including SBE I (see the description of the application page 2), none of the cited prior art documents discloses nor suggests the two newly identified SBE II according to the present application.

Thus, the subject-matter of the claims which have not objected to for lack of novelty seem to fulfil the requirements of Article 33.2 and 3 PCT.

**Item VIII.**

The term "corresponding region" used in claims 6 and 16 is vague and unclear and leave the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear (Article 6 PCT).

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>MJL/C283.1/N</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 97/ 03032</b>	International filing date (day/month/year) <b>04/11/1997</b>	(Earliest) Priority Date (day/month/year) <b>05/11/1996</b>
Applicant <b>NATIONAL STARCH AND CHEMICAL ... et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (see Box I).

2. ☐ Unity of invention is lacking (see Box II).

3. ☒ The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing

☒ filed with the international application.

☐ furnished by the applicant separately from the international application,

☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.

☐ Transcribed by this Authority

4. With regard to the **title**, ☒ the text is approved as submitted by the applicant

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is:

Figure No. 1 ☒ as suggested by the applicant.

☐ None of the figures.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

## INTERNATIONAL SEARCH REPORT

International Application No.

PC/GB 97/03032

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/82 C12N9/10 C12Q1/68 C12N1/21 C12N15/54  
A01H5/00

According to International Patent Classification(IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C12Q A01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SALEHUZZAMAN, S.N.I.M., ET AL . : "CLONING, PARTIAL SEQUENCING AND EXPRESSION OF A cDNA CODING FOR BRANCHING ENZYME IN CASSAVA" PLANT MOLECULAR BIOLOGY, vol. 20, 1992, pages 809-819, XP002056647 PAGE 810, LEFT; PAGE 814, RIGHT COLUMN, LINE 11-20; PAGE 817, RIGHT COLUMN, PAGE 818, LAST PARAGRAPH --- -/--	1-3, 11-13



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## ° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

28 April 1998

Date of mailing of the international search report

20/05/1998

Name and mailing address of the ISA

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Authorized officer

Holtorf, S



## INTERNATIONAL SEARCH REPORT

International Application No.

PC/GB 97/03032

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BURTON R A ET AL: "STARCH BRANCHING ENZYMES BELONGING TO DISTINCT ENZYME FAMILIES ARE DIFFERENTIALLY EXPRESSED DURING PEA EMBRYO DEVELOPMENT" PLANT JOURNAL, vol. 7, no. 1, January 1995, pages 3-15, XP002014042 cited in the application see the whole document ---	1-3, 11-13
X	FISHER, D.K., ET AL.: "TWO CLOSELY RELATED cDNAs ENCODING STARCH BRANCHING ENZYME FROM ARABIDOPSIS THALIANA" PLANT MOLECULAR BIOLOGY, vol. 30, 1996, pages 97-108, XP002056648 see figure 3 ---	1-4, 11-13
X	BURTON, R.A., ET AL.: "STARCH BRANCHING ENZYMES BELONGING TO DISTINCT ENZYME FAMILIES ARE DIFFERENTIALLY EXPRESSED DURING PEA EMBRYO DEVELOPMENT" EMBL SEQUENCE DATA LIBRARY, 6 July 1994, HEIDELBERG, GERMANY, XP002056649 ACCESSION No. G10545 ---	1-3, 11-13
A	WO 92 11375 A (AMYLOGENE HB) 9 July 1992 PAGE 7,8,12; PAGE 24; PAGE 25, LINE 6-19 ---	1-31
A	WO 94 11520 A (ZENECA LTD ;KEELING PETER LEWIS (GB)) 26 May 1994 PAGE 2, LINE 31-36; PAGE 4, LINE 29-36; PAGE 5 ---	1-31
A	WO 95 26407 A (NAT STARCH CHEM INVEST ;COOKE DAVID (GB); GIDLEY MICHAEL JOHN (GB)) 5 October 1995 POTATO SBE GENE , USED IN ANTISENSE APPROACH see the whole document ---	1-31
P,X	WO 96 34968 A (NAT STARCH CHEM INVEST ;COOKE DAVID (GB); DEBET MARTINE (GB); GIDL) 7 November 1996 PAGE 4,5; PAGE 8,14,21; CLAIM 66 ---	1-3, 11-13,15
P,X	WO 97 22703 A (DU PONT ;HUBBARD NATALIE LOUISE (US); KLEIN THEODORE MITCHELL (US)) 26 June 1997 see the whole document ---	12,13
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